

## WHAT IS CLAIMED IS:

1. ~~A wavelength division multiplex optical star coupler~~  
comprising:

an input port which inputs a first optical signal;

a first optical coupler which divides said first optical signal input from said input port into a plurality of first optical signals;

a plurality of input/output ports, each of which outputs one of said plurality of first optical signals divided by said first optical coupler and inputs a second optical signal;

an output port which outputs said second optical signal;  
and

a second optical coupler, provided between said input port and said first optical coupler or between said first optical coupler and said input/output ports, which provides said first optical signal to said input/output ports and said second optical signal to said output port.

2. A wavelength division multiplex optical star coupler as claimed in claim 1 having a plurality of said output ports and a plurality of said second optical couplers, each of which is provided between said first optical coupler and one of said input/output ports, wherein:

each of said second optical couplers provides one of said second optical signals to one of said plurality of output ports;  
and

each of said plurality of output ports outputs one of said second optical signals.

3. A wavelength division multiplex optical star coupler as claimed in claim 1, wherein said second optical coupler is provided between said input port and said first optical coupler;

~~said first optical coupler further multiplexes a plurality~~

~~of said second optical signals and provides said second optical signal to said second optical coupler; and~~

said second optical coupler provides said first optical signal input from said input port to said first optical coupler and provides said second optical signal multiplexed by said first optical coupler to said output port.

4. A wavelength division multiplex optical star coupler as claimed in any of claims 1 through 3, wherein said second optical coupler is a wavelength division multiplex optical coupler that selects an optical signal, a wavelength of which has a prescribed relationship with a wavelength of said second optical signal, from optical signals input to said second optical coupler and outputs said selected optical signal to said output port.

5. A wavelength division multiplex optical star coupler as claimed in any of claims 1 through 4, wherein each of said input port, said input/output port, and said output port having an optical connector adapter that mounts an optical fiber in such a way as capable of attaching and removing said optical fiber.

6. A communication station comprising:

an electro-optical converter which inputs an electric signal and converts said electric signal to a first optical signal;

a first optical coupler which divides said first optical signal into a plurality of first optical signals;

a plurality of input/output ports, each of which outputs one of said plurality of first optical signals divided by said first optical coupler and inputs a second optical signal;

an output port which outputs said second optical signal;

a second optical coupler, provided between said electro-optical converter and said first optical coupler or ~~between said first optical coupler and said input/output ports,~~

~~which provides said first optical signal to said input/output ports and said second optical signal to said output port;~~

~~an opto-electric converter which converts said second optical signal output from said output port to a second electric signal; and~~

~~an electric signal output terminal which outputs said second electric signal.~~

7. A communication station as claimed in claim 6 having:

a plurality of said output ports,

a plurality of said second optical couplers, each of which is provided between said first optical coupler and one of said input/output ports,

a plurality of said opto-electric converters, each of which is provided for one of a plurality of said output ports, and

an electric signal multiplexer which multiplexes a plurality of said second electric signals output from a plurality of said opto-electric converters and outputs said multiplexed second electric signal to said electric signal output terminal, wherein:

each of said second optical couplers provides one of said second optical signals to one of said plurality of output ports;

each of said plurality of output ports outputs one of said second optical signals; and

each of said plurality of opto-electric converters converts one of said second optical signals to said second electric signal.

8. A communication station as claimed in claim 6, wherein said second optical coupler is provided between said electro-optical converter and said first optical coupler;

said first optical coupler further multiplexes a plurality of said second optical signals and provides said second optical signal to said second optical coupler; and

~~said second optical coupler provides said first optical~~

~~signal input from said electro-optical converter to said first optical coupler and provides said second optical signal multiplexed by said first optical coupler to said output port.~~

9. A communication station as claimed in any of claims 6 through 8, wherein said second optical coupler is a wavelength division multiplex optical coupler that selects an optical signal, which has a wavelength having a prescribed relationship with wavelength of said second optical signal, from optical signals input to said second optical coupler and outputs said selected optical signal to said output port.

10. A communication station as claimed in any of claims 6 through 9, wherein each of said input/output port and said output port having an optical connector adapter that mounts an optical fiber in such a way as capable of attaching and removing said optical fiber.

11. An optical transmission system comprising:

a main unit which inputs a first electric signal and outputs a plurality of first optical signals, and inputs a second optical signal and outputs a second electric signal;

a plurality of sub units, each of which inputs one of said plurality of first optical signals from said main unit and outputs a third electric signal, and inputs a fourth electric signal and provides said second optical signal to said main unit; and

a plurality of optical fibers, each of which connects said main unit and said plurality of sub units,

wherein said main unit has:

an electro-optical converter which inputs said first electric signal and converts said first electric signal to a first optical signal;

a first optical coupler which divides said first optical signal into a plurality of first optical signals;

a plurality of input/output ports, each of which outputs one of said plurality of first optical signals divided by said first optical coupler to one of said sub units through one of said optical fibers and inputs said second optical signal from one of said sub units through one of said optical fibers;

an output port which outputs said second optical signal;

a second optical coupler, provided between said electro-optical converter and said first optical coupler or between said first optical coupler and said input/output ports, which provides said first optical signal to said input/output ports and said second optical signal to said output port;

an opto-electric converter which converts said second optical signal output from said output port to a second electric signal; and

an electric signal output terminal which outputs said second electric signal.

12. An optical transmission system as claimed in claim 11 having:

a plurality of said output ports,

a plurality of said second optical couplers, each of which is provided between said first optical coupler and one of said input/output ports,

a plurality of said opto-electric converters, each of which is provided for one of a plurality of said output ports, and

a electric signal multiplexer which multiplexes a plurality of said second electric signals output from a plurality of said opto-electric converters and outputs said multiplexed second electric signal to said electric signal output terminal, wherein:

each of said second optical couplers provides one of said second optical signals to one of said plurality of output ports;

each of said plurality of output ports outputs one of said second optical signals; and

each of said opto-electric converters converts one of said

second optical signals to said second electric signal.

13. An optical transmission system as claimed in claim 11, wherein said second optical coupler is provided between said electro-optical converter and said first optical coupler;

said first optical coupler further multiplexes a plurality of said second optical signals and provides said second optical signal to said second optical coupler; and

said second optical coupler provides said first optical signal input from said electro-optical converter to said first optical coupler and provides said second optical signal multiplexed by said first optical coupler to said output port.

14. An optical transmission system as claimed in any of claims 11 through 13, wherein said second optical coupler is a wavelength division multiplex optical coupler that selects a optical signal, a wavelength of which has a prescribed relationship with a wavelength of said second optical signal, from optical signals input to said second optical coupler and outputs said selected optical signal to said output port.

15. An optical transmission system as claimed in any of claims 11 through 14, wherein said sub unit has:

a sub unit input/output terminal which inputs said first optical signal from said main unit through said optical fiber;

an opto-electric converter which inputs said first optical signal and converts said first optical signal to said third electric signal;

an antenna which outputs said third electric signal and inputs said fourth electric signal;

an electro-optical converter which converts said fourth electric signal to said second optical signal; and

a wavelength division multiplex optical coupler which provides said first optical signal to said opto-electric

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